DDS-PLL SYNTHESIZER

DPL-2.5GF

USER'S MANUAL

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DPL-2.5GF is wide band signal generator utilizing DDS (Direct Digital Synthesis) and PLL (Phase Locked Loop) technique. It provides pure signal output from 700MHz – 2.5GHz in 10Hz steps. The frequency can be controlled by serial data which can be connected to PC communication port and can be memorized into EEPROM and in case of setting the power off, and on again, the stored frequency can be output. The temperature compensated internal 10MHz clock provides high stability in wide temperature range

In case the accurate 10MHz clock is available externally, the frequency stability can be improved. The half or quarter of the output frequency is available by adding optional frequency divider.

■ Specification

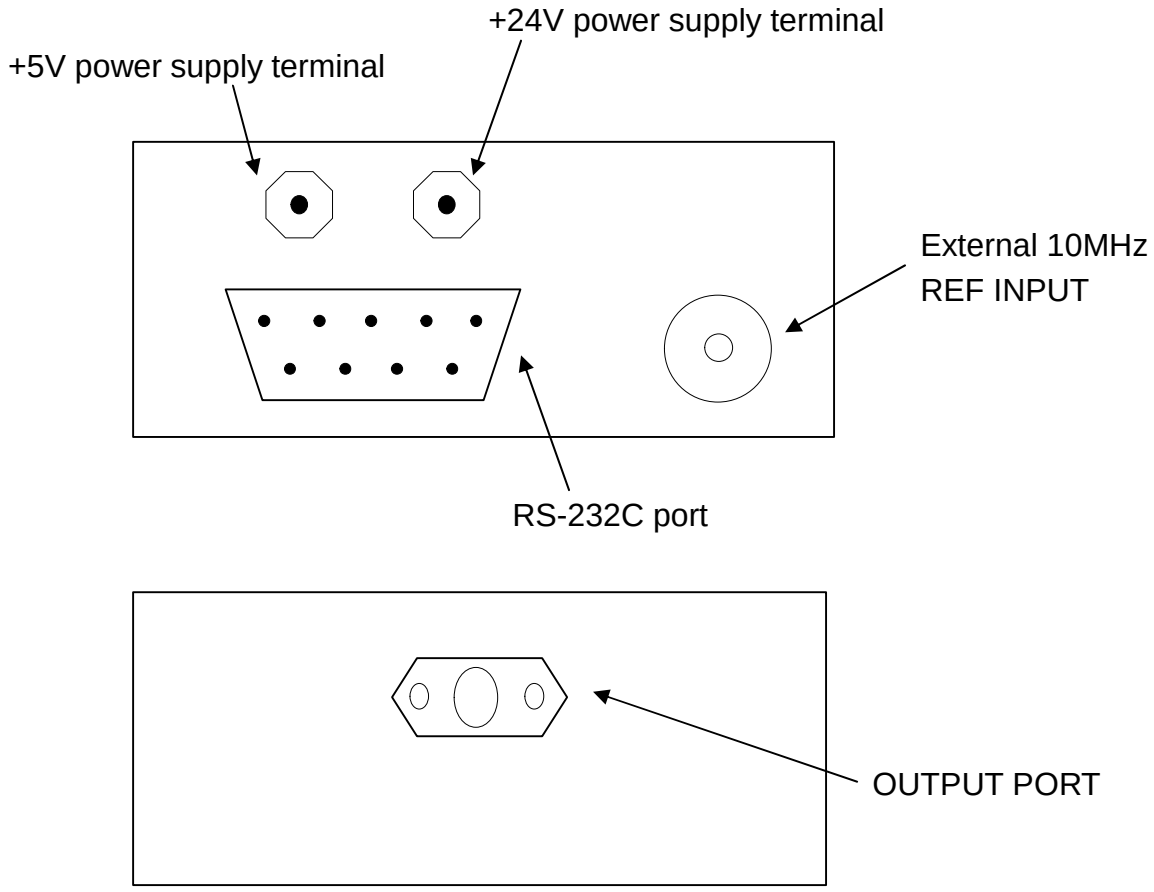
Power supply	+5V±5% 100mA
	+24V±10% 200mA
Frequency range	700MHz – 2500MHz
Output level	0 dBm ±3dB
Output impedance	50Ω
Frequency resolution	10Hz
Spurious	less than –60dB (except harmonic)
Harmonic spurious	more than –10dBc

Phase noise

	OFFSET from carrier center frequency		
	1KHz	10KHz	100KHz
700MHz	-85dBc/Hz	-80dBc/Hz	-93dBc/Hz
1000MHz	-82dBc/Hz	-80dBc/Hz	-96dBc/Hz
2500MHz	-77dBc/Hz	-77dBc/Hz	-97dBc/Hz

Internal clock	
temperature frequency stability	±2.5ppm(0～50℃)
long term frequency stability	±3ppm per year
frequency accuracy	±2.5ppm@25℃(adjustable)
External reference input	10MHz 0.5-5Vp-p
External ref. Input impedance	more than 10kΩ
Non-Volatile memory save times	more than 10,000
Frequency control	RS-232C async serial input, 9pin D-SUB
	9600BPS, 8 bit without parity 1 stop bit
Dimensions	104x67x29mm

■ How to connect terminal



Caution: The polarity of the power supply should be connected correctly not to damage the DPL-2.5GF unit.

1. +5V power supply terminal

Connect 5V±5% the power supply having more than 100mA current capacity

2. +24V power supply terminal

Connect 24V±10% power supply having more than 200mA current capacity

3. External 10MHz reference clock input

Apply 10MHz reference clock in external clock mode. SMA connector is used.

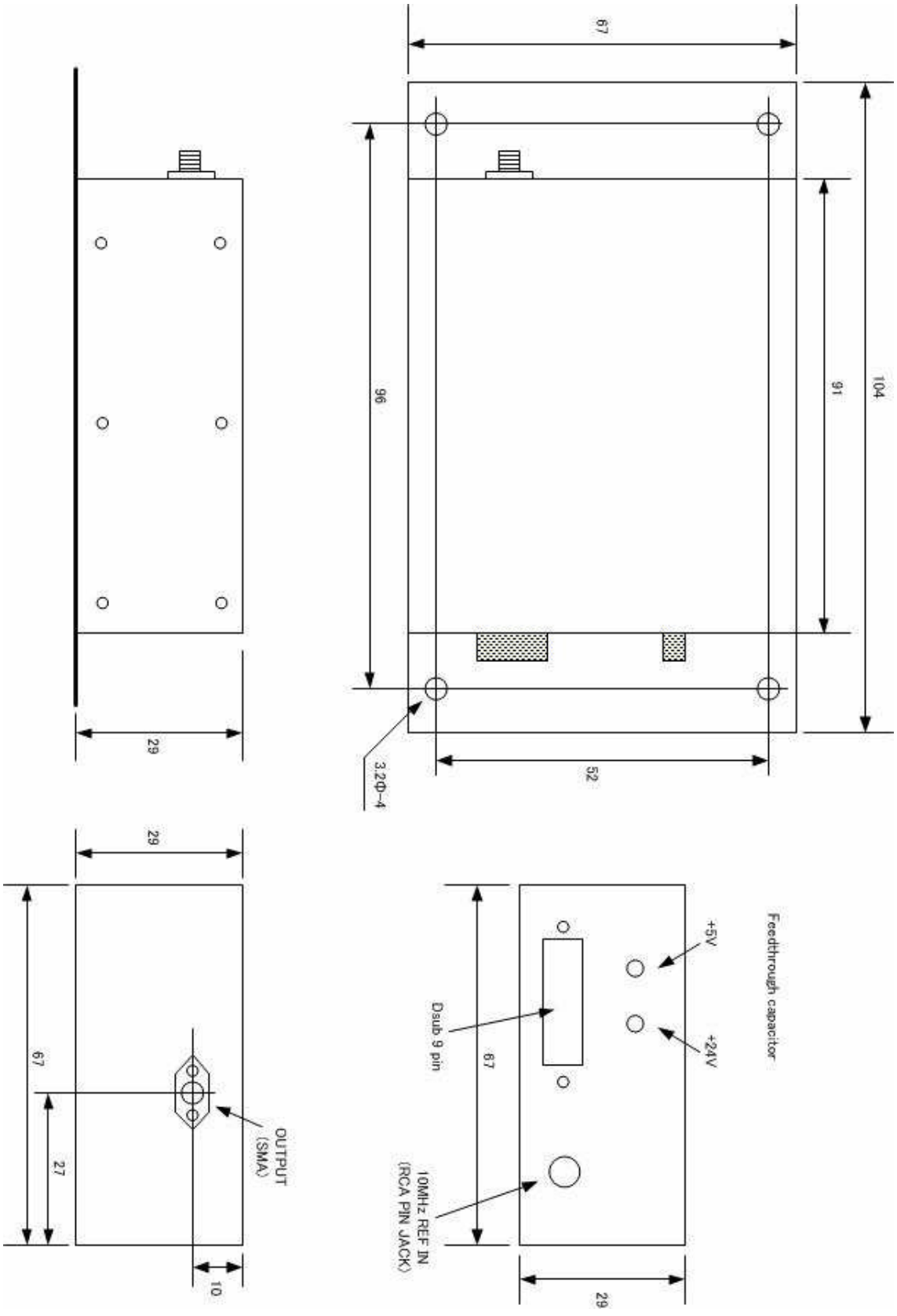
4. RS-232C port

This is a signal control connector to set a frequency. The frequency is controlled by RS-232C serial input and 9 pin D-Sub female connector is used.

5. Output port

This is a terminal of output signal. SMA connector is used.

■ OUTLINE


67
104
91
96
52
3.2Φ-4
29
29
67
27
OUTPUT
(SMA)
10
+5V
+24V
Feedthrough capacitor
Dsub 9 pin
67
10MHz REF IN
(RCA PIN JACK)
29

■ RS-232C port communication condition

Communication speed	9600BPS Aysncronous
Data length	8bit
Stop bit	1bit
Parity	none
Flow control	none

9 pin D-SUB pin ordering

Pin#	Signal name	Signal direction	Ref
		DPL-2.5GF <-> terminal	
1	CD	－>	connected to DTR internally
6	DSR	－>	connected to DTR internally
2	RD	－>	
7	RTS	<－	not used
3	TD	<－	
8	CTS	－>	connected to DTR internally
4	DTR	<－	“ CD,CTS,DSR “
9	RI	－>	not used
5	GND	<－>	

It is possible to set frequency, using common PC communication software, for example Hyperterminal and so on.

■ How to set frequency

The following message is returned when DPL-2.5GF is power on.

DPL-2.5GF OSCILLATOR VX.X
XXXXXXXX CLOCK MODE
＊

XXXXXXXX shows the present selected clock mode. After prompt “＊” is returned from DPL-2.5GF, enter frequency data. The frequency data has three formats, MHz unit input, KHz unit input and 10Hz unit input.
When DPL-2.5GF received the data correctly and completed the frequency setting, it returns “＊” as a prompt and output the desired frequency. When the data received in-correctly or some errors occurred during the transfer, it returns “INVALID DATA”. Each time the frequency data is set consecutively, first make sure whether “＊” code is returned, then set new frequency.

Input on MHz unit

The following example shows the data in case setting 2300.00000MHz in MHz unit.

2	3	0	0	M	CR
32	33	30	30	4D	0D
hex	hex	hex	hex	hex	hex

The data below 100KHz is set at “0” automatically.

Input on KHz unit

The following example shows the data in case setting 2300000.00KHz on KHz unit.

2	3	0	0	0	0	0	K	CR
32	33	30	30	30	30	30	4B	0D
hex	hex	hex	hex	hex	hex	hex	hex	hex

The data below 100Hz is set at “0” automatically

Input on 10Hz unit

The following example shows the data in case setting 2300000000Hz on 10Hz unit.

2	3	0	0	0	0	0	0	0	CR
32	33	30	30	30	30	30	30	30	0D
hex	hex	hex	hex	hex	hex	hex	hex	hex	hex

■ How to memorize the frequency

In order to memorize the current frequency into the built-in EEPROM, enter “SAVE” command as shown below. “CURRENT FRQUENCY IS SAVED!” message is returned, if the command is received correctly.

S	A	V	E	CR
53	41	56	45	0D
hex	hex	hex	hex	hex

■ How to change a reference clock source

Internal or external clock mode can be toggled by entering “EXT” command.

Enter the following command.

E	X	T	CR
53	41	56	0D
hex	hex	hex	hex

When the above command is received correctly, the following message is returned in external clock mode.

“CURRENT CLOCK SOURCE =>EXTERNAL”
“Do you want to change clock source? (Y/N)

Clock mode can be changed from external to internal by entering “Y”.
This clock mode is saved in EEPROM and fixed semi-permanently until next “ EXT” command is issued.

■ How to adjust the internal reference clock.

When the internal reference clock frequency is deviated, adjust as follows:
(1) Confirm whether the present clock mode is internal clock mode. If it is in external clock mode, change to internal clock mode with “EXT” command.
(2) Connect to a high resolution frequency counter, and set a frequency such as 1000.00000MHz.
(3) Then enter “DBUG” command and DBUG menu will be shown below.
(4) Select “3: INTERNAL CLOCK FREQUENCY ADJUST” so that the following message will be shown.
“FREQUENCY ADJUST (u or d) = > XXXX”
XXXXX is the current hexadecimal correction value which has no meanings. Enter the following character to up or down the frequency with frequency counter.

“u” : To step the frequency up finely
“d” : To step the frequency down finely
“U” : To step the frequency up coarsely
“D” : To step the frequency down coarsely

(5) Input “E” for the end of adjustment.

■ Cautions :

(1) Use the low rippled power supply. When the switching power supply is used, use noise filter to reduce switching noise from the power supply.
(2) Pay attention to the accuracy of the power supply voltage because+5V power supply voltage affects output level.
(3) In external clock mode, use the external 10MHz clock having the frequency accuracy of less than 3 ppm.
(4) The external reference input is high impedance. In case of connecting with 50Ω coaxial cable, use 50Ω termination.

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